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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	William Wilkins
Serial No.:	Second CPA of 09/127,256
Filed:	February 9, 2000 (original filed July 31, 1998)
For:	**Compliant Heat Exchange Panel**
Art Unit:	3743
Examiner:	Leonard R. Leo

ASSISTANT COMMISSIONER FOR
PATENTS
Washington, DC 20231

DECLARATION UNDER RULE 37 CFR 1.131

I, Michael A. Kast, P.E., declare and state:

I received a Bachelor of Science Degree from the Thermosciences Division of Stanford University (hereinafter "Stanford"), Stanford, California, in 1974, being awarded the L. M. Dinkelspiel Award for Contributions to Undergraduate Education and the Royal Society of the Arts Award for Achievements in Engineering. I also received a Master's Degree from the Thermosciences Division of Stanford in 1975.

After training at Stanford I worked for Stanford in one of its experimental programs as a research and design engineer. After leaving Stanford, I founded two companies with others. In one of the companies I managed the development and manufacturing of a product relating to temperature control, which product is still in manufacture. After selling this company, I became the Vice President of Engineering of a corporation where I directed a staff of 10 engineers and designers in another product design. After completing the product design, I formed my own engineering

consulting firm. As one of my assignments I was asked by potential investors to investigate the Cool Systems, Inc. products developed by William Elkins. Thus, prior to undertaking the review and analysis mentioned below, I was generally familiar with the work of Mr. Elkins.

I have analyzed the prosecution history of the above patent application, as well as the teachings of the Haugeneder patent reference, U.S. Patent No. 5,080,166. The major question I was asked is whether or not someone skilled in the field defined by the claims in Exhibit A would find the subject matter of such claims obvious as defined by Section 103(a) of the U.S. Code, title 35. Specifically, I was asked whether or not in my opinion the subject matter as a whole set forth in the Exhibit A claims would have been obvious to a person having ordinary skill in the art to which such subject matter pertains, in view of the admitted prior art set forth in Fig. 2 of the above patent application in light of the teachings of Haugeneder U.S. Patent No. 5,080,166. In my opinion, it would not. For one thing, one of ordinary skill in the field of the subject matter of the claim of Exhibit A, the field of Fig. 2, would not look to the Haugeneder patent for a solution to the problem of proving a greater area of thermal contact in a compliant heat exchange panel while assuring the panel retains it ability to maintain stable flow distribution characteristics when applied to a complex and dynamically changing three-dimensional form. The Haugeneder patent discloses a rigid panel having two rigid plates separated by spacing elements. It is clear from the sectional view of Fig. 3 of Haugeneder, in which 20, 21, and 22 represent posts and 24, 25, and 26 represent the flow space between such posts, that Haugeneder was not concerned about the problem of his spacing elements interfering with the size of the area of thermal contact, much less such elements exhibiting the ability of the panel to conform to complex and dynamically changing three dimensional forms.

I, Michael A. Kast, do hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are

believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of this application, and of any patent issuing thereon.

Michael A. Kast

SIGNATURE

3/6/2000

DATE

Exhibit A to Declaration of Michael A. Kast

in Second CPA of Serial No. 09/127,256 Naming

William Elkins as Inventor

1. A heat exchange panel to be conformed to a complex shape, comprising:

a first layer of a flexible material, which layer is conformable to a complex shape;

a second layer of a flexible material, which layer also is conformable to a complex shape and has a common border with the first layer;

a border seal sealing the first layer and the second layer at said border; and

said first and second layers being directly secured together interiorly of said border at a multiplicity of points to form a dot matrix of attachtments organized into first imaginary lines and second imaginary lines for connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to 100°.

3. The panel of claim 1, wherein:

the border seal includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

4. The panel of claim 3, further comprising:

a first port for passing a fluid into the panel;

a second port for passing said fluid out of the panel; and

at least one fence interiorly of said border sealing the first layer and the second layer, said fence cooperating with said border to define a fluid flow channel within said panel.

5. The panel of claim 4, wherein:

the fence includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of the fence.

6. A method of manufacturing a heat exchange panel which conforms to a complex shape comprising the steps of:

sealing a first layer of a flexible material, which layer is conformable to a complex shape to a second layer of a flexible material at a common border, which second layer is also conformable to a complex shape; and

sealing said first layer to said second layer interiorly of said border at a multiplicity of points to form a dot matrix of attachments, said dot matrix organized into first imaginary lines and second imaginary lines for connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to 110°.

8. The method of claim 6, wherein:

the first step of sealing includes sealing said first layer to said second layer with a border seal having curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

9. The method of claim 6, further comprising steps of:

constructing first and second ports for passing a fluid into and out of said panel; and

sealing said first layer to said second layer with at least one fence between said first port and said second port, said fence having curvilinear ripples having ripple cycle lengths substantially shorter than the length of said fence.

10. A method for exchanging heat with a complex shape, comprising the steps of:

receiving a fluid flow in a first port;

restricting passage of said fluid flow to between first and second layers of flexible materials which are conformable to a complex shape;

further restricting said passage with a border seal at a common border between said first and said second layers;

passing said fluid flow about a multiplicity of points, interiorly of said first and second layers, said first and second layers being directly secured together to form a dot matrix of attachments organized into first imaginary lines and second imaginary lines connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to 110°; and

issuing said fluid flow through a second port.

12. The method of claim 10, wherein:

said border seal includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

13. The method of claim 10, further comprising a step of:

further restricting said fluid flow with at least one fence between said first port and said second port.

14. The method of claim 13, wherein:

said fence includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of the sealing fence.

15. A system for exchanging heat with a complex shape; comprising:

a heat transfer device for one of cooling or heating a fluid;

a pump/reservoir coupled to the heat transfer device for storing and pumping said fluid; and

a heat exchange panel coupled to the pump/reservoir and the heat transfer device, the heat exchange panel including a first layer of a flexible material conformable to a complex shape, a second layer of a flexible material also conformable to a complex shape, a border seal sealing said first layer and said second layer together at said border, a first port for receiving said fluid, a second port contiguous with said first port for issuing said fluid, and said first and second layers being directly sealed together interiorly of said border seal to form a dot matrix of attachments between said first and second layers, said dot matrix organized into first imaginary lines and second imaginary lines for connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in the range of between about 70° to 110°.

16. The system of claim 15, wherein:

one of (i) said first lines and (ii) said second lines has an angle in a range of about 25° to 65° with respect to a nominal direction of a flow of said fluid.

17. The system of claim 15, wherein:

said border seal includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

18. The system of claim 15, wherein:

the heat exchange panel further includes at least one fence interiorly of the border sealing said first layer and said second layer together, said fence cooperating with said border to define a fluid flow channel within said panel.

19. The panel of claim 18, wherein:

said fence includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of said fence.

20. The panel of claim 4, wherein said first and second ports are contiguous.

22. A heat exchange panel to be conformed to a complex shape, comprising:

a first layer of a flexible material, which layer is conformable to a complex shape;

a second layer of a flexible material, which layer also is conformable to a complex shape;

a border seal sealing the first layer and the second layer to form a border, the border seal including curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

23. The heat exchange panel of claim 22 further including at least one fence interiorly of said border, which fence is sealed to the first layer and the second layer, and includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of the fence.

24. The heat exchange panel of claim 23 further including a first port for passing fluid into the panel and a second port for passing said fluid out of the panel, said first and second ports being contiguous.